Claims

1. A wavelength locker for locking the wavelength of a light beam substantially to a predetermined wavelength, the wavelength locker comprising at least one Fabry-Perot etalon arranged to receive a sample portion of the light beam and to produce at least one output light beam therefrom, the intensity of which is dependent upon the wavelength of the sample light beam, wherein the Fabry-Perot etalon comprises diamond.

2. A wavelength drift detector for detecting the drift of the wavelength of a light beam from a predetermined wavelength, the wavelength drift detector comprising at least one Fabry-Perot etalon arranged to receive a sample portion of the light beam to produce at least one output light beam therefrom, the intensity of which is dependent upon the wavelength of the sample light beam, wherein the Fabry-Perot etalon comprises diamond.

3. A wavelength locker according to Claim 1, or a wavelength drift detector according to Claim 2, further comprising adjustment means, dependent upon the output of the etalon, for adjusting the wavelength of the light beam in order to reduce or eliminate its drift from the predetermined wavelength.

4. A wavelength locker or drift detector according to Claim 3, in which the adjustment means comprise control electronics.

5. A wavelength locker or drift detector according to Claim 3 or Claim 4, in which the adjustment means is/are arranged to control a light source that generates the light beam.

6. A wavelength locker or drift detector according to Claim 5, in which the light source is remote from the wavelength locker or drift detector, and the adjustment means transmits a control signal to the light source to adjust the wavelength of the light beam.

7. A wavelength locker or drift detector according to Claim 5, in which the light source comprises a part of the wavelength locker or drift detector.

8. A wavelength locker or drift detector according to any preceding claim, in which the light beam comprises an optical signal, and the sample portion of the light beam comprises a sample portion of the optical signal.

9. An optical signal transmitter comprising a wavelength locker or drift detector according to Claim 8, the optical signal transmitter including a light source which generates the optical signal.

10. A wavelength locker, drift detector or transmitter according to Claim 5 or any claim dependent thereon, in which the light source comprises a laser.

11. The use of diamond as a Fabry-Perot etalon in a wavelength locker, drift detector, or optical signal transmitter according to any preceding claim.

12. A wavelength locker, drift detector, transmitter, or use according to any preceding claim, in which the diamond comprises a single crystal diamond.

13. A wavelength locker, drift detector, transmitter, or use according to any preceding claim, in which the diamond is a synthetic diamond.

14. A wavelength locker, drift detector, transmitter, or use according to Claim 13, in which the diamond has been formed by chemical vapour deposition.

15. A wavelength locker, drift detector, transmitter, or use according to any preceding claim, in which the diamond is substantially free from defects.

16. A wavelength locker, drift detector, transmitter, or use according to any preceding claim, in which the diamond etalon comprises a partially-reflective input face and an opposite partially-reflective output face, separated by a thickness of the etalon.

17. A wavelength locker, drift detector, transmitter, or use according to Claim 16, in which the input and output faces are substantially flat and lie in substantially parallel planes.

18. A wavelength locker, drift detector, transmitter, or use according to Claim 16 or Claim 17, in which the input and output faces are polished.

19. A wavelength locker, drift detector, transmitter, or use according to any one of claims 16 to 18, in which the input face and/or the output face is/are free from any coating.

20. A wavelength locker, drift detector, transmitter, or use according to any one of claims 16 to 19, in which the thickness of the diamond etalon is at least 0.1 mm, preferably at least 0.2 mm, especially at least 0.5 mm.

21. A wavelength locker, drift detector, transmitter, or use according to any one of claims 16 to 20, in which the thickness of the diamond

etalon is no greater than 5.0 mm, preferably no greater than 4.0 mm, especially no greater than 2.0 mm.

22. A wavelength locker, drift detector, transmitter, or use according to Claim 20 or Claim 21, in which the diamond etalon has a thickness in the range 1.0 mm to 1.5 mm, preferably having a thickness of 1.25 mm.

23. A wavelength locker, drift detector, transmitter, or use according to any preceding claim, in which the diamond etalon has transmitted and reflected wavelength dependent output characteristics, each of which has a free spectral range of 2X GHz, allowing wavelength locking points at spacings of both 2X GHz and X GHz.

24. A wavelength locker, drift detector, transmitter, or use according to Claim 23, in which wavelength locking points at spacings of X GHz are determined by a difference between the transmitted and reflected wavelength dependent output characteristics of the etalon.

25. A wavelength locker, drift detector, transmitter, or use according to Claim 24, in which the amplitude of the difference between the transmitted and reflected wavelength dependent output characteristics of the etalon is preset such that the wavelength locking points are X GHz apart.

26. A wavelength locker, drift detector, transmitter, or use according to any one of claims 23 to 25, in which X is 25.